



FAST DRY WHITE AND YELLOW CHLORINATED RUBBER TRAFFIC MARKING PAINT
MGS-91-10B

1.0 DESCRIPTION. These specifications cover ready-mixed white and yellow paint suitable for application on concrete and bituminous pavements.

2.0 MATERIALS. The exact composition of the paint is be left to the discretion of the manufacturer except as stipulated hereinafter. The paint shall contain no lead, chromium, cadmium, or barium. The manufacturer shall furnish to the department the batch formula used to produce the paint.

2.1 Pigment Constituents.

2.1.1 Organic yellow shall be pigment yellow C.I. #75 or #65.

2.1.2 Titanium dioxide shall comply with ASTM Specification D476-84, Type I, Anatase or Rutile Type II, Type III, or Type IV.

2.1.3 Magnesium silicate shall consist substantially of natural hydrous magnesium silicate that is white, fibrous, finely ground, and is commercially known as paint pigment quality.

2.1.4 Zinc oxide shall comply with ASTM Specification D79-86.

2.1.5 Calcium carbonate shall comply with ASTM Specification D1199-86, Type GC, Grade I.

2.1.6 Organo-montmorillonite shall be a finely divided hydrous magnesium aluminum silicate mineral activated with 95% methyl alcohol.

2.2 Vehicle Constituents.

2.2.1 The alkyd resin solution shall be a medium length soya or linseed oil pure drying type alkyd that has been reduced in VM and P Naphtha to a 59-61% solids contents. The VM and P Naphtha shall meet the requirements of Federal Specifications TT-N-95b, Type I. The solution shall contain a minimum of 33% phthalic anhydride based on the alkyd solids. The alkyd resin solution shall be compatible when tested in accordance with this specification.

2.2.2 The chlorinated rubber (20 Centipoise Type) shall have the following properties:

Chlorine	64 to 69%
Color (Gardner, 20% by weight in toluene)	4 maximum
Viscosity, 77F (20%, by weight in toluene)	17 to 25 (Centipoises)

2.2.3 Compatibility Test for Alkyd Resin Solution. A solution containing 100 grams of chlorinated rubber, 130 grams of the alkyd resin solution, and 290 grams of solvent system A or B depending on what system the producer used, shall be clear, transparent and show no separation after 24 hours storage in a 3/4 full test tube at $26.7^{\circ} \pm 2.8^{\circ} \text{ C. } (80^{\circ} \pm 5^{\circ} \text{ F.})$.

2.2.4 Chlorinated paraffin shall meet Federal Specification MIL-C-429C, Type I.

2.2.5 Methyl Ethyl Ketone shall comply with ASTM Specification D 740-87.

2.2.6 Aromatic naphtha shall meet ASTM D 3734-87, Type I.

2.2.7 Methyl alcohol shall meet ASTM Specifications D1152-84.

2.2.8 Driers shall be non-lead driers suitable for use in paints.

2.2.9 Anti-Skinning Agent shall be suitable for use in paints.

2.2.10 Acetone shall meet ASTM Specification D 329-86.

2.2.11 Methyl Isobutyl Ketone (MIBK) shall meet ASTM Specification D 1153-87.

2.3 Solvent System. The supplier shall notify the department of the solvent system he intends to use. The solvent system shall be either A - 100% Methyl Ethyl Ketone (MEK) or B - 25% Methyl Isobutyl Ketone (MIBK) and 75% Acetone. The supplier shall not change solvent systems without notifying the department prior to starting a batch. No combinations of A or B may be used.

2.4 Mixed Paint. The paint shall be strained before filling, using a screen not coarser than 40 mesh or a suitable sieve meeting the approval of the Engineer.

2.4.1 No allowance for mixing losses will be made in determining percentages of pigment. The mixed paint shall contain the required percentages of pigment upon analysis. Pigments and vehicles extracted from these paints will be subjected to testing by appropriate methods including wet chemical, atomic absorption, x-ray, flame emission, infrared, liquid chromatography or other available means as may be deemed necessary by the department to assure compliance with the specifications. If outside testing labs are used, the manufacturer will pay the cost of these tests on any batches the department finds not to be in compliance with these specifications.

2.4.2 Physical Properties.

	<u>White</u>	<u>Yellow</u>
% Pigment, by weight	48 to 50	50.5 to 52.5
% Vehicle, by weight	50 to 52	47.5 to 49.5
% Nonvolatile Vehicle, by weight, minimum	38%	38%
Grind (Hegman Gage) minimum	3	3
Viscosity, 77 F, Krebs units	70 to 80	70 to 80
Dry Time, Minutes, Max. ASTM D711	10	10

2.4.3 No skinning shall be present on the surface when the paint is allowed to stand in a partly filled closed container for 72 hours. The paint shall be free of lumps and skins when strained through a No. 100 mesh sieve at the end of the 72 hour period.

2.4.4 Settling. The pigmented binder in full pint triple-sealed friction top, unlined tin cans shall show no dense or hard settling when stored free of vibration at 120°F air temperature for 5 days. At the end of that period the pigmented binder shall be cooled at room temperature for 4 hours before examination. The degree of settling shall have a rating of 6 or better when evaluated in accordance with ASTM D 869. In making the tests, the filled (filled to bottom of the lip) triple-sealed friction top unlined tin can shall

be placed in an inverted position for one hour to insure a complete seal between cover and body of the can. At the end of one hour, the filled can shall be placed in an upright position for at least one hour before placing it in an air temperature of 120°F. The can or cans shall be placed in a single tier.

2.4.5 Contrast Ratio. The minimum contrast ratio shall be 0.96 when applied at a wet film thickness of 15 mils. The wet film, as determined by an Interchemical Wet Film Thickness Gage shall be applied to a 2A Leneta Chart or equal. After air drying for 24 hours, measure the luminous reflectance of white and black sections. Contrast ratio = Black/White.

2.4.6 Reflectance. The daylight directional reflectance of a dry film white paint (without glass spheres) shall not be less than 80%. The daylight directional reflectance of a dry film of yellow paint (without glass spheres) shall not be less than 50%. A 15 mil wet film of paint as determined by an Interchemical Wet Film Thickness Gage shall be applied to a form 2A Leneta chart or equal. After air drying for 24 hours, measure the luminous reflectance on the dry film over a black square using a Hunterlab D 25-9 Colorimeter. Test Method ASTM E-97.

2.4.7 Color. The color after drying shall (for white) be a pure flat white, free from tint, furnishing the maximum amount of opacity and visibility under both daylight and artificial light. For yellow, the color shall closely match Chip 33538 of Federal Standard 595 and shall conform to the following CIE Chromaticity Coordinate limits:

\bar{x}	\bar{y}	\bar{x}	\bar{y}	\bar{x}	\bar{y}	\bar{x}	\bar{y}
0.470	0.455	0.501	0.452	0.479	0.428	0.462	0.438

3.0 ACCEPTANCE.

3.1 The paint shall be homogeneous, well ground, shall not settle badly or cake in the container, and shall readily break up with a paddle to a smooth uniform consistency. It shall be free from water, dirt, and other foreign matter and shall dry within the specified period to a good, tough, serviceable film.

3.2 The paint shall be capable of outdoor storage in unopened drums at least 15 months. Any paint which shall have livered or in any way hardened or thickened in the container, or in which the pigment shall have settled out so that it cannot be remixed by hand and mechanical mixing to a smooth uniform suspension of useable consistency, shall be disposed of by the supplier and immediately replaced with acceptable material entirely at the suppliers expense including handling and transportation charges.

4.0 QUALIFICATION OF BIDDER. No bid will be considered unless the firm submitting the bid can meeting the following conditions:

4.1 That it has in operation a plant adequate for, and devoted to, manufacture of the pavement marking paint that it proposes to furnish, and is capable of producing batch sizes consistent with the quantities to be delivered.

4.2 That it maintains a laboratory to scientifically control the product bid upon to assure accuracy and quality of formulation.

4.3 That it has produced fast drying material over the past year with a successful application record.

5.0 SERVICE. Since proper application is deemed essential to the success of this process, the manufacturer shall have at least one technician available to instruct in the application of this type of paint. The technician shall be familiar with the application equipment and the materials, and shall have successful experience in the placing of fast drying chlorinated polyolefin traffic paint.

6.0 PURCHASING. The ready-mixed paint shall be purchased by volume. One (1) gallon shall mean two hundred thirty-one (231) cubic inches at seventy-seven (77) degrees Fahrenheit.